

Listed are abstracts from recent papers by IBM authors. Inquiries should be directed to the publications cited.

Abstracts

Computers team up, P. M. Grant, T. R. Lusebrink and D. G. Taupin, *Industrial Research* 14, No. 12, 50-53 (November 1972). This paper describes the use of the hosted-satellite concept at the IBM San Jose Research Laboratory to implement project-distributed System/7s connected via high-speed teleprocessing to the laboratory's main computer facility, a System/360 Model 195.

Micromultiprocessing: An approach to multiprocessing at the level of very small tasks, J. L. Rosenfeld and R. D. Villani, *IEEE Transactions on Computers* C-22, No. 2, 149-153 (February 1973). The design and performance evaluation of a multiprocessor system are described. The system consists of processing units sharing the processing of the same instruction stream, where tasks consist of individual instructions. The multiprocessing aspect is completely transparent to the user. The system configuration developed calls for two microprogrammed processing units sharing the same local and control stores. Simulated execution of instruction sequences demonstrated a 20 percent increase in instruction processing speed over that for a single CPU. A companion study shows even better performance (37 percent increase) with a different mode of interaction. This improved performance and substantially increased availability can be achieved at the cost of a single board of LSI logic.

A video display system for image processing by computer, N. H. Kreitzer and W. J. Fitzgerald, *IEEE Transactions on Computers* C-22, No. 2, 128-134 (February 1973). A core-refreshed video display system that can display gray-scale images of 32 intensity levels on a standard monochrome video monitor will be described. The system can also display flicker-free black and white images of more than 800,000 picture elements. There are special features that allow overlaying black and white images on 16-level gray-scale images and manual cursor control via an X-Y tablet. Multiple reduced size images can be accommodated by features that allow independent manipulation of images in separate areas on the display screen. This permits simultaneous display of images before and after processing.

Waiting-time distributions and buffer overflow in priority queueing systems, D. A. Gall and H. R. Mueller, *IEEE Transactions on Communications* COM-20, No. 5, 865-877 (October 1972). This paper presents a numerical technique for the solution of a class of queueing problems having fixed priority assignment synchronous service, constant service time, and finite number of sources. The analysis yields waiting-time distributions, namely, the probabilities of waiting exactly nW service cycles or longer. It applies to scanners, multiplexer channels, loop configurations, etc. It is especially useful for worst case design in that it permits the calculation of overflow probabilities. Results are given in the form of curves and are compared with those for exponential service times. A priority scheme is outlined that allows partial elimination of the geometrical priorities inherent to loop multiplexers.